

## THE CLAIMS

What is claimed:

- 1           1.       An implant for fixation of a bone comprising:  
2           a shaft having a proximal end and a distal end, the shaft defining a longitudinal axis  
3       between the proximal end and the distal end; and  
4           a plurality of blades disposed on at least a portion of the shaft and helically twisted  
5       about the longitudinal axis, the plurality of blades having a proximal end and a distal end;  
6           wherein at least one of the blades has a variable blade width that varies in a direction  
7       along the longitudinal axis.
- 1           2.       The implant of claim 1, wherein the variable blade width increases in a  
2       direction from the blade proximal end toward the blade distal end.
- 1           3.       The implant of claim 1, wherein at least one of the blades has a variable  
2       blade height that varies in a direction along the longitudinal axis.
- 1           4.       The implant of claim 1, wherein at least one of the blades has a substantially  
2       constant blade width.
- 1           5.       The implant of claim 1, wherein the plurality of blades twist about 90° about  
2       the longitudinal axis.
- 1           6.       The implant of claim 3, wherein the variable blade height increases in a  
2       direction from the blade proximal end toward the blade distal end.
- 1           7.       The implant of claim 3, wherein at least one of the blades has a substantially  
2       constant blade height.
- 1           8.       The implant of claim 1, wherein the plurality of blades comprises:  
2           at least first and second blades substantially diametrically opposed from one another  
3       about the longitudinal axis; and  
4           at least third and fourth blades substantially diametrically opposed from one another  
5       about the longitudinal axis;  
6           wherein at least one of the first and second blades has a variable blade width that  
7       increases in a direction along the longitudinal axis, and at least one of the third and fourth  
8       blades has a variable blade height that increases in a direction along the longitudinal axis.

1           9.       The implant of claim 6, wherein the blade height of the variable blade is  
2 substantially zero at the blade proximal end.

1           10.      The implant of claim 9, wherein:  
2           at least one of the first and second blades has a substantially constant blade height;  
3 and  
4           at least one of the third and fourth blades has a substantially constant blade width.

1           11.      The implant of claim 10, wherein:  
2           the first and second blades have a variable blade width that increases in a direction  
3 along the longitudinal axis, and a substantially constant blade height;  
4           the third blade has a blade height that increases in a direction along the longitudinal  
5 axis, and a substantially constant blade width; and  
6           the fourth blade has a substantially constant blade height, and a substantially  
7 constant blade width.

1           12.      The implant of claim 11, wherein the first and second blades are out of phase  
2 with the third and fourth blades by about 90° about the longitudinal axis.

1           13.      The implant of claim 1, wherein the implant is configured and dimensioned  
2 for implantation in a femoral head.

1           14.      The implant of claim 1, further comprising a cannulation extending from the  
2 proximal end to the distal end, the cannulation configured and dimensioned to receive a  
3 guide wire.

1           15.      The implant of claim 1, wherein the distal end is configured and dimensioned  
2 for attachment to an insertion device.

1           16.      An implant for fixation of a bone comprising:  
2           a shaft defining a longitudinal axis of the implant, the shaft including a bladed  
3 portion and a non-bladed portion, the bladed portion and the non-bladed portion each  
4 having a diameter;  
5           a plurality of blades disposed on the bladed portion and helically twisted about the  
6 longitudinal axis, wherein the maximum diameter of the bladed portion is smaller than the  
7 maximum diameter of the non-bladed portion.

1           17.     The implant of claim 16, wherein the non-bladed portion includes a tapered  
2 region located substantially adjacent the bladed portion, wherein the tapered region defines  
3 a tapered region diameter that decreases in a direction toward the bladed portion.

1           18.     The implant of claim 17, wherein the tapered region is configured and  
2 dimensioned to provide even stress distribution over the tapered region.

1           19.     The implant of claim 17, wherein the tapered region is concave.

1           20.     The implant of claim 17, wherein the tapered region provides uniform  
2 bending of the implant.

1           21.     The implant of claim 17, wherein the tapered region further defines a neck  
2 diameter at a point substantially adjacent the blades, wherein the neck diameter is smaller  
3 than the blade diameter.

1           22.     The implant of claim 17, wherein the implant has proximal and distal ends  
2 located on the longitudinal axis, and the bladed portion is located substantially adjacent one  
3 of the ends.

1           23.     The implant of claim 16, wherein the implant is configured and dimensioned  
2 for implantation in a femoral head.

1           24.     The implant of claim 16, further comprising a cannulation extending  
2 substantially along the longitudinal axis of the shaft, the cannulation configured and  
3 dimensioned to receive a guide wire.

1           25.     An implant for fixation of a bone comprising:  
2 a shaft having a proximal end and a distal end, the shaft defining a longitudinal axis  
3 between the proximal end and the distal end; and  
4 a plurality of blades disposed on at least a portion of the shaft and helically twisted  
5 about the longitudinal axis, the plurality of blades having a proximal end and a distal end;  
6 wherein at least one of the blades has a variable blade height that varies in a  
7 direction along the longitudinal axis.

1           26.     The implant of claim 25, wherein the variable blade height increases in a  
2 direction from the blade proximal end toward the blade distal end.

1           27.     The implant of claim 26, wherein the variable blade height is substantially  
2 zero at the blade proximal end.

1           28.     The implant of claim 25, wherein at least one of the blades has a  
2 substantially constant blade height.

1           29.     The implant of claim 25, wherein at least one of the blades has a variable  
2 blade width that varies in a direction along the longitudinal axis.

1           30.     The implant of claim 29, wherein the variable blade width increases in a  
2 direction from the blade proximal end toward the blade distal end.

1           31.     The implant of claim 25, wherein at least one of the blades has a  
2 substantially constant blade width.

1           32.     The implant of claim 25, wherein the plurality of blades twist about 90°  
2 about the longitudinal axis.

1           33.     The implant of claim 25, wherein the implant is configured and dimensioned  
2 for implantation in a femoral head.

1           34.     The implant of claim 25, further comprising a cannulation extending from  
2 the proximal end to the distal end, the cannulation configured and dimensioned to receive a  
3 guide wire.

1           35.     The implant of claim 25, wherein the distal end is configured and  
2 dimensioned for attachment to an insertion device.